REMARKS

I. Status of the Claims

Claims 36-57 are pending in this application. Claims 36, 45 and 49 are amended in this response. Claims 37 and 46 are cancelled in this response. Claims 36, 38-45, and 47-57 remain for consideration.

II. Response to the Double Patenting Rejection

The Examiner has rejected the current application under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-31 of U.S. Pat. No. 6,291,386. In order to facilitate processing of the current application, Applicant is submitting an attached Terminal Disclaimer under 37 C.F.R. 1.321(c). The terminal disclaimer meets the requirements of the statute.

III. Response to the Section 112 Rejection

The rejection of claims 35-57 under 35 USC 112 is respectfully traversed. By this amendment, claims 36, 45 and 49 have been amended as required by the Examiner. In addition, Applicant has cancelled claims 37 and 46 in this response.

Applicant respectfully traverses Examiner's objection to the use of "polymerization system" in combination with the term "in-situ" in claims 36 and 45. The term "in-situ" is used to describe the formation of the active catalyst within the polymerization system. Applicant respectfully asserts that the two terms as used in the current application do not conflict with each other. For instance, the current specification states that the "precatalyst, either supported or unsupported, is introduced into the polymerization system where it is contacted with an organometallic alkylating agent to form the alkylated cationic transition metal catalyst in-situ" (at p. 12. l. 8-10)."

In addition, the abstract has been corrected as required by Examiner.

Accordingly, reconsideration and withdrawal of the rejection under 35 USC 112 is requested.

IV. Response to the § 103(a) Rejections

A. Response to the § 103(a) Rejection over Hlatky, Ewen, or Hasewaga in view of either Turner or Tomotsu

Applicant traverses the rejection of claims 36-41 and 43-57 under 35 U.S.C. § 103 as being unpatentable over either Hlatky et al. (U.S. Pat. No. 5,153,157), Ewen et al. (U.S. Pat. No. 5,519,100), or Hasewage et al. (U.S. Pat. No. 5,576,259) in view of either Turner (U.S. Pat. No. 4,752,597) or Tomotsu et al. (U.S. Pat. No. 5,786,433), and he respectfully asks the Examiner to reconsider and withdraw the rejection in view of the following remarks.

"A proper analysis under § 103 requires, inter alia, consideration of two factors: (1) whether the prior art would have suggested to those of ordinary skill in the art that they should make the claimed composition or device, or carry out the claimed process; and (2) whether the prior art would also have revealed that in so making or carrying out, those of ordinary skill would have a reasonable expectation of success." *In re Vaeck*, 947 F.2d 488 (Fed. Cir. 1991). The prior art neither suggests the claimed invention, nor would give one of ordinary skill a reasonable expectation that the claimed process would be successful or advantageous.

There is no teaching, suggestion, or incentive in either Hlatky, Ewen, or Hasewage to develop Applicant's claimed process. Applicant's claimed process is a two-step process that first requires contacting a transition metal dihalide (alkoxy, aryloxy, or amido) compound with a boron-containing ionizing agent to produce a precatalyst, followed by in-situ alkylation of the precatalyst to form an active catalyst in the polymerization system in the presence of at least one olefin monomer. The cited prior art references teach the use of pre-formed alkylated metallocenes and the formation of the cationic active catalyst prior to addition into the polymerization system. Hlatky discloses a process in which a pre-formed dialkyl- or dihydride-metallocene is reacted with an ionic borate and an alkyl aluminum to produce the cationic metallocene catalyst active in olefin polymerization. Like the Hlatky reference, Ewen and Hasewage also disclose a process in which a pre-formed dialkyl-metallocene is reacted with an

ionic borate to produce a cationic metallocene active catalyst. Unlike the prior art references, Applicant's process does not use a pre-formed transition metal dialkyl compound, but first forms a precatalyst by contacting a transition metal dihalide (alkoxy, aryloxy, or amido) compound with a boron-containing ionizing agent, followed by in-situ alkylation of the precatalyst in the polymerization system in the presence of at least one olefin monomer.

Thus, Hlatky, Ewen, and Hasewage do not teach or suggest the possibility of in-situ alkylation of a transition metal dihalide in the polymerization system. Hlatky Ewen, and Hasewage do not even suggest that there is a problem that needs to be overcome. As seen from the current application, a pre-formed alkylated transition metal compound exhibits decreased catalyst activity with longer shelf-life times. Applicant has solved this problem by the in-situ alkylation process in which a more stable transition metal dihalide (alkoxy, aryloxy, or amido) compound is stored until use in polymerization. In-situ alkylation prevents loss in catalyst activity by forming the alkylated catalyst only when it is needed in the polymerization system.

Although Turner (at Examples 1 and 2) and Tomotsu (at Col. 9, l. 33 to Col. 10, l. 37) may arguably teach that otherwise identical metallocenes differing in whether the ancillary ligands are halides or alkyls are art-recognizably interchangeable, as Examiner suggests, at most the combination of Hlatly, Ewen or Hasewage with Turner or Tomotsu would lead on of ordinary skill in the art to try to pre-form a catalyst using halide (alkoxy, aryloxy, or amido) compound. The combination does not suggest Applicant's process for forming an active catalyst in-situ by adding a precatalyst produced by combining a transition metal complex and a boron-containing ionizing agent to produce a precatalyst, followed by in-situ alkylation of the precatalyst in the polymerization system in the presence of at least one olefin monomer. In the current application, Applicant includes a comparison example in which a pre-formed dialkyl transition metal complex [(1-methylboratabenzene)(cyclopentadienyl) dimethyl zirconium] is used in place of Applicant's process. As seen in Comparative Example 1, olefin polymerization with (1-methylboratabenzene)(cyclopentadienyl) dimethyl zirconium activated with an ionic borate in the presence of an alkyl aluminium gives

much lower productivity compared to Applicant's process. Thus, one of the advantages of Applicant's process is that it is not necessary to pre-form a less stable dialkyl transition metal complex before use in olefin polymerization.

In addition, the combination of Hlatly, Ewen or Hasewage with Turner or Tomotsu would not lead to the expectation that Applicant's process would lead to higher productivity compared with the use of pre-formed catalysts discussed in the cited prior art.

In sum, neither Hlatky, Ewen, nor Hasewage suggest Applicant's in-situ alkylation process nor its advantage for increasing catalyst activity with longer shelf-life. Accordingly, reconsideration and withdrawal of this rejection is requested.

B. Response to the § 103(a) Rejection over Hlatky, Ewen, Hasewaga, Turner or Tomotsu in view of Etherton

Applicant traverses the rejection of claim 4 under under 35 U.S.C. § 103 as being unpatentable over Hlatky, Ewen, Hasewage, Turner or Tomotsu in view of Etherton et al. (U.S. Pat. No. 5,539,124), and he respectfully asks the Examiner to reconsider and withdraw the rejection in view of the following remarks.

As discussed above, a combination of Hlatky, Ewen, Hasewage, Turner and Tomotsu does not disclose Applicant's in-situ alkylation process nor its advantage for increasing catalyst activity with longer shelf-life. Although Etherton does disclose the use of polymerization-stable heterocyclic pyrollyl ligands in olefin polymerization catalysts, there is nothing to suggest their use in Applicant's in-situ process when the cited prior art teaches only the use of pre-formed alkylated metallocenes and the formation of the cationic active catalyst before addition into the polymerization system.

In sum, the combination of Hlatky (et al.) and Etherton does not teach the use of transition metal complexes containing polymerization-stable heterocyclic ligands (such as pyrollyl) in Applicant's in-situ catalyst preparation process. Accordingly, reconsideration and withdrawal of this rejection is requested.

In view of the foregoing, Applicant respectfully asks the Examiner to reconsider and withdraw the rejections and pass the case to issue.

Applicant invites the Examiner to telephone his agent at (610) 359-3480 if he believes that a discussion of the application might be helpful.

I hereby certify that this correspondence is being deposited with the United States Postal Service as first-class mail, with sufficient postage, in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on November 19, 2003.

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Name of person signing

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